FOUR UNDESCRIBED MOTHS FROM EASTERN NORTH AMERICA, WITH NOTES ON CLOSELY RELATED SPECIES (LEPIDOPTERA, PHALAENIDAE *OLIM* NOCTUIDAE).

By J. G. Franclemont, Washington, D. C.

The four species of noctuids described at this time to make the names available for use in the Third Part (Noctuidae) of the Lepidoptera of New York and Neighboring States, soon to appear, have been confused, in most collections, with well known and closely related species.

Phalaeninae (*olim* Agrotinae, *recte* Noctuinae)

Euagrotis lubricans (Guenée)

Noctua lubricans Guenée, Histoire Naturelle des Insectes, Species Général des Lépidoptères, vol. 5 (Noctuélites 1), p. 323, Noctuélites pl. 5, fig. 7, 1852.

Type locality: "Floride."

Location of type: British Museum (Natural History).

Mamestra associans Walker, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, part 15, p. 1683, 1858.

Type locality: "East Florida."

Location of type: British Museum (Natural History).

Noctua spreta Smith, Jour. New York Ent. Soc., vol. 10, p. 36, 1902.

Type locality: "Hastings, Florida."

Location of type: Rutgers University.

Euagrotis lubricans (Guenée) and *E. illapsa* (Walker) show no constant tangible differences in the genitalia of either sex. I would consider them races of one species, if it were not for the marked differences in appearance, *illapsa* with translucent white hind wings, *lubricans* with smoky fuscous brown ones, *illapsa* with the overall pattern more sharply defined, and if it were not for the different ranges, that of *illapsa* from Texas and Florida to Ontario and Quebec, and that of *lubricans* from Florida and the Gulf States to North Carolina, with that of *illapsa* overlapping the entire range of *lubricans*. The answer to their true relationship will only come when some careful field worker collects both forms through several seasons and rears them side by side.

E. lubricans is double brooded at Raleigh, North Carolina, and

probably triple or more brooded further south. The moth was not uncommon at bait during late March and early April at Daleville, Alabama, in the spring of 1943.

Male genitalia as figured. (Figures 1 and 1A.)

Female genitalia as figured. (Figure 4.)

Euagrotis illapsa (Walker)

Graphiphora illapsa Walker, List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, part 11, p. 744, 1857.

Type locality: "St. Martin's Falls, Albany River, Hudson's Bay."

Location of type: British Museum (Natural History).

Walker's type of *illapsa* is a rather small female specimen, expanse 29 mm., somewhat water stained and with the abdomen unfortunately missing; however, the general habitus and pattern of the specimen leave no doubt as to its identity. It is a fully marked specimen, as fully as found in this species, with the ordinary lines blackish, and the hind wing somewhat darker than usual, but this can be matched by specimens before me. As stated in the discussion of *lubricans,* the range of this species covers almost the entire temperate part of eastern North America. It is double brooded at Ithaca, New York, and at Arlington, Virginia.

Male genitalia as figured. (Figure 2.) The figures of the valves of *lubricans* and *illapsa* show the total differences that can be expected; usually specimens do not exhibit the degree of difference shown by the two chosen for illustration.

Euagrotis forbesi n. sp.

This species resembles *illapsa* (Walker), but is distinctly larger, has a more powdery appearance, and the markings are more blurred and less distinct; it is slightly larger than *lubricans* (Guenée) and differs by the translucent white hind wing in both sexes. The male genitalia differ from both *illapsa* and *lubricans* by having a single, short, blunt spine on the vesica, absent in those two species, by having a weak digitus on the valve, also lacking in *lubricans* and *illapsa,* and by having the margins of the valves almost parallel.

Head and thorax whitish blue-gray with some rosy or brown tints; the collar with a wide, black, basal band. Forewings concolorous with thorax, the ground color overlaid with a mixture of rosy, blackish and brownish scales, varying in intensity and emphasis with individual specimens; the ordinary markings vague and blurred, hardly discernable in most specimens, the five, black, tri-

angular costal spots on each wing, representing the inception of the transverse lines, very prominent; about half the specimens with the reniform outlined on outer and lower sides by black, the others with only a vague or no indication of the reniform; orbicular absent; the t. a. and t. p. lines very vague, their paths indicated by some dark or pale scales in a few specimens. Hind wings in the male translucent white with a narrow fuscous border, wider toward costa; in the female translucent white heavily infuscate, the base lightest and the outer margin darkest; fringe in both sexes white.

Expanse: 38–42 mm.

Male genitalia as figured. (Figures 3, 3A and 3B.)

Female genitalia as figured. (Figure 5.)

Type: Male, Claremont, New Hampshire, July 10, 1911, in the U. S. National Museum Collection. USNM Type No. 61477.

Paratypes: 1 male, Meach Lake, Ottawa Co., Quebec, July 8–14; 1 male, Oldtown, Maine; 2 males, Newton Highlands, Massachusetts, W. Barnes; 1 male, Bear Mountain, New York, H. J. Erb; 1 male, Bethlehem, Pennsylvania, July 24 (*ex* Doll Collection); 1 male, Lititz, Pennsylvania, J. J. Heiserman; 1 male, White Mills, Pennsylvania, August 20 (*ex* Doll Collection); 1 male, Louisville, Kentucky, July 21, B. Nettelroth (*ex* Doll Collection); 1 female, Newton Highlands, Massachusetts, W. Barnes; 1 female, Concord, Massachusetts, July 21, 1913, William Reiff; 1 female, Franklin Co., New York, July 1886, C. S. McKnight (*ex* Doll Collection); 1 female, Hudson, New York, July 6 (*ex* Doll Collection); 1 female, Allegany State Park, New York, July 24, 1937, R. Shadle; 1 female, Skyland, Virginia, July 6, 1911, H. G. Dyar; 1 female, Louisville, Kentucky, July 6, B. Nettelroth (*ex* Doll Collection); 1 female, Houston, Texas, July 10 (*ex* Doll Collection); all in the Collection of the U. S. National Museum. 1 male, Bear Mountain, New York, H. J. Erb; in the Collection of Cornell University, Department of Entomology. [The data on specimens from the Doll Collection cannot always be trusted, and I doubt very much that the specimen bearing the Houston, Texas, label actually came from there because other specimens from the Doll Collection with this locality have proved to be incorrectly labelled. The locality Louisville, Kentucky, should also be viewed with skepticism; the two specimens probably came from much further east in the state.]

This species is named in honor of Professor W. T. M. Forbes, of Cornell University.

Hadeninae

Leucania linda n. sp.

This species is similar to *Leucania anteroclara* form *calgariana* Smith in general appearance, but it has the specializations of the

phragmatidicola-commoides group. This species will key to *phragmatidicola* Guenée in Hampson, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 5, p. 482, 1905, and has been confused with that species in collections. It may be separated from *phragmatidicola* by the darker, more reddish and more striated forewing, and by the more fuscous hind wing with the veins dark scaled. The male genitalia have the cucullus of the valve more elongate and narrower, and the uncus broader and different in shape.

Head and thorax pale, luteous fawn color with some reddish brown powdering, most evident in second brood specimens; the collar with three more or less prominent, dark, grayish transverse lines; the patagia with a longitudinal gray line near inner margin. The forewings concolorous with the thorax, overlaid and strongly streaked with reddish shades, the veins whitish with accompanying dark streaks on each side; the basal section of Cu (so-called Median) strongly whitish, and enlarging into a spot at the point of separation of Cu_1, M_3 and M_2, with a small black point resting on the white spot or in the upper part of it, the dark streaks above and below Cu often very conspicuous and often strongly blackish; usually with a small black point below at about middle of streak; a series of black points, in the interspaces, forming an excurved arc from costa to inner margin at about outer fifth of wing. All ordinary lines and spots absent. Hind wing translucent white, strongly shaded with fuscous, especially toward the outer margin, the whole wing darker in the female.

Expanse: First brood, 36–41 mm.; second brood, 31–36 mm.

Male genitalia as figured. (Figures 6 and 6A.)

Female genitalia as figured. (Figure 8.) The ductus bursae not as long as in *phragmatidicola.*

Type: Male, Arlington, Virginia, 9 June 1948, J. G. Franclemont, in U. S. National Museum Collection (*ex* Franclemont Collection), USNM Type No. 61478.

Paratypes: 52 males and 60 females, first brood, Arlington, Virginia, 21 May–18 June, 1948–51; 59 males and 87 females, second brood, Arlington, Virginia, 26 July–15 October, 1948–1951; all collected by J. G. Franclemont; 4 in Cornell University, Department of Entomology Collection, 254 in Franclemont Collection. 1 male, Raleigh, North Carolina, in the Cornell University, Department of Entomology Collection. 1 male, Lakehurst, New Jersey, 17 September, Frederick Lemmer; 1 male, Glen Echo, Maryland, June 2; 2 males, Washington, D. C., May 17, 1882; 1 male, Wash-

ington, D. C., May 22, 1882; 1 male, Washington, D. C., 30 May, 1916; 7 females, Lakehurst, New Jersey, 17 September, Frederick Lemmer; 2 females, Washington, D. C., 3 and 12 August 1882; 1 female, Raleigh, North Carolina, 9 August 1905; 1 female, Tryon, North Carolina, May 27, 1904, Fiske Collection; all in the U. S. National Museum Collection.

In addition, the species has been seen from the following localities: Martha's Vineyard and Newton Highlands, Massachusetts; McLean Bogs and North Collins, New York, as well as specimens merely labelled "New York"; Chicago, Illinois; Pennsylvania, Tennessee and Texas.

This species is dedicated to a very gracious lady, Mrs. Frank Morton Jones, of Wilmington, Delaware.

Cuculliinae

Eupsilia sidus (Guenée)

Scopelosoma sidus Guenée, Histoire Naturelle des Insectes, Species Général des Lépidoptères, vol. 5 (Noctuélites 1), p. 386, 1852.

Type locality: "Amérique Septentrionale."
Location of type: Destroyed!

Dichagramma walkerii Grote, Proc. Ent. Soc. Philadelphia, vol. 2, p. 439, pl. 9, fig. 5, 1864.

Type locality: "Canada; Middle States."
Location of type: Lost!

Scopelosoma colorado Smith, Jour. New York Ent. Soc., vol. 11, p. 21, 1903.

Type locality: "Glenwood Springs, Colorado."
Location of type: U. S. National Museum.

The following is a translation of the original French description of *sidus*:

"Extremely similar to *Satellitia,* from which it appears to me however to differ by the following characters:

"The forewings are noticeably broader and shorter, with the teeth more rounded, with the costa more convex, with the inner margin more strongly bent at the base, then almost parallel to the costa; also, with the outer margin less rounded, of a very uniform brick red, with the lines hardly distinct; the reniform spot is like that in variety A ["la tache réniforme d'un jaune-safrané"], but it must also probably be white."

From what we know about the source of Boisduval's material described by Guenée, it seems safe to assume that the type of *sidus*

was collected by Say in New Jersey, given to Leconte and sent by Leconte to Boisduval.

Part of the "exotics" described by Guenée from the Boisduval Collection were destroyed after Guenée returned them to Boisduval and before Charles Oberthur purchased the Boisduval Collection in 1873. In response to an inquiry by William Barnes, the purchaser of all the North American material in the Charles Oberthur Collection, René Oberthur, brother of Charles, explained the absence of many of the types in the Charles Oberthur Collection by disclosing that after the material was returned, it was allowed to remain in poor boxes on top of the cabinets; consequently, it became infested with dermestids. Most of the infested material was thrown away, but some, still in good condition was given to Deyrolle for disposal; Mabille bought this material, and René Oberthur, purchaser of the Mabille Collection, gave the moths to his brother Charles; so it must be assumed that any missing types had been destroyed.

The species I identify with this name is common throughout the eastern United States, and particularly common in New Jersey in the barrens areas. The vestiture of the forewings is soft; the scales are very deeply cleft with the long ends twisted and curled, giving the wing the appearance of excelsior or shredded wheat when viewed under the low power of the microscope. This is a very unique feature in the noctuids, possessed by two other species in this genus. The fringe is only slightly toothed, with the teeth well rounded. The color is warm red-brown, when very fresh, to dull, dusky brick red, very uniform in appearance; the lines are obsolescent, the t. a. slightly waved near costa, the t. p. dark and dentate; the reniform is usually yellow or white, rarely orange.

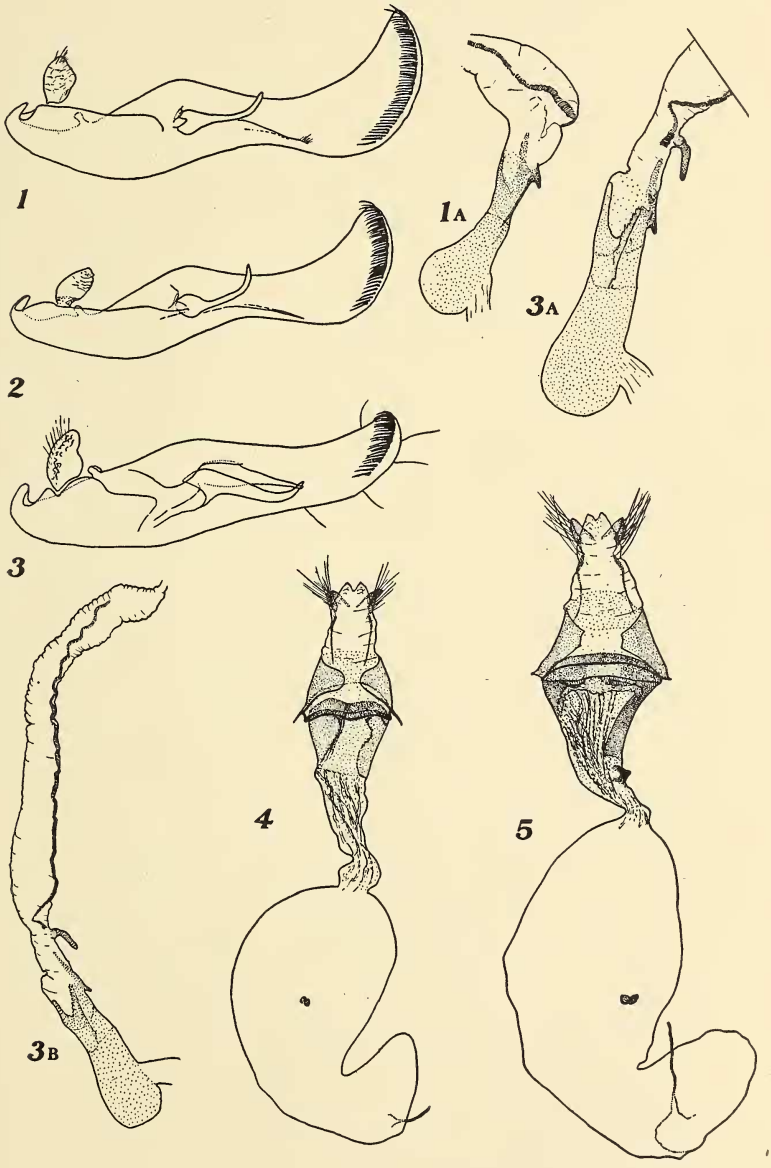
Male genitalia (figures 19 and 10A) with the cucullus of the valve narrow and the juxta broad at the apex.

Female genitalia (figure 14) with four very conspicuous signa on the bursa; with a prominent pouch at upper left of bursa; and with a strongly chitinized, ridged area near the opening of the ductus bursae into the bursa.

Explanation of Plate VII

1. *Euagrotis lubricans,* male genitalia, right valve. 1A. *E. lubricans,* male genitalia, aedoeagus. 2. *E. illapsa,* male genitalia, right valve. 3. *E. forbesi,* male genitalia, right valve. 3A. *E. forbesi,* male genitalia, aedoeagus. 3B. *E. forbesi,* male genitalia, aedoeagus with vesica fully extended. 4. *E. lubricans,* female genitalia. 5. *E. forbesi,* female genitalia.

BULL. B. E. S. VOL. XLVII PLATE VII



As identified here, *walkeri* Grote is a synonym, and judging from the figure and description it was based on a worn hibernated specimen. Grote's type is also lost, but was probably also from the vicinity of Philadelphia since it was in the collection of the Entomological Society of Philadelphia. Mr. Rehn informed me that the collections of the American Entomological Society, successor of the Entomological Society of Philadelphia, were turned over to the Academy of Natural Sciences in the 1880's; what happened to them in the late 50's and during the 70's is not known, but many of the Grote, and Grote and Robinson types have disappeared.

Colorado Smith may be treated as a race of this species; it is slightly paler, whether this character will hold in fresh material I do not know.

Eupsilia cirripalea n. sp.

The vestiture is similar to that of *sidus,* but the color is browner, and the outer margin of the forewing is strongly toothed. The genitalia of both sexes are very distinctive; the juxta of the male has a blister-like bulge at middle, and bursa of female has only two signa.

Head, thorax and forewings deep russet brown to reddish brown, rather uniform. The vestiture of the forewings soft, composed of deeply forked scales with the long ends twisted and curled; the ordinary lines evident, but not strongly marked; the basal half-line wide, undulate and pale; the t. a. line, wide, almost straight and erect, pale; the t. p. line narrow, dentate and black; the median shade evident, dark, wide, angled out below reniform; s. t. line vague, pale undulating. Orbicular absent; reniform bright fiery orange or white. Hind wings fuscous with a pinkish hue; the fringes pale. Abdomen concolorous with hind wings, with lateral and anal tufts reddish.

Expanse: 35–39 mm.

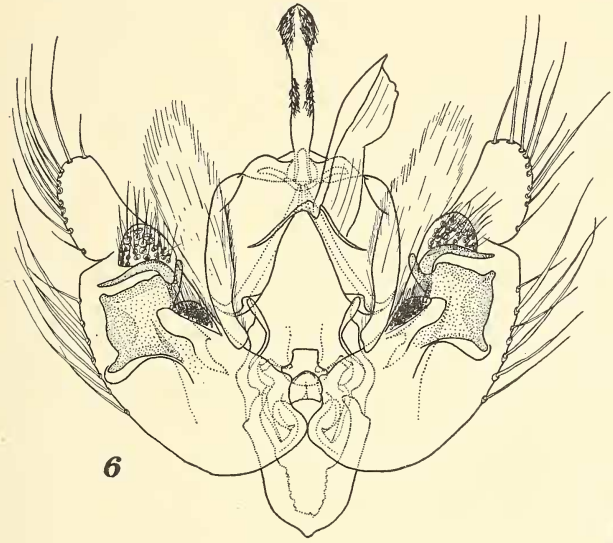
Male genitalia (figures 9 and 9A) similar to *sidus,* but with broader valves, the digitus longer and stouter, the clasper shorter, and with a strong, raised, conical, median process on the juxta.

Female genitalia (figure 12) with two longitudinal signa, and with a small chitinized, ridged area near the junction of the ductus bursae and bursa.

Explanation of Plate VIII

6. *Leucania phragmatidicola,* male genitalia. 6A. *L. phragmatidicola,* male genitalia, aedoeagus. 7. *L. linda,* male genitalia. 7A. *L. linda,* male genitalia, aedoeagus. 8. *Leucania linda,* female genitalia.

BULL. B. E. S. VOL. XLVII PLATE VIII



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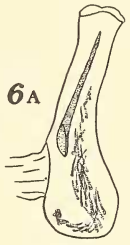
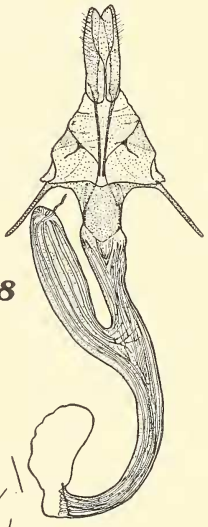


6A



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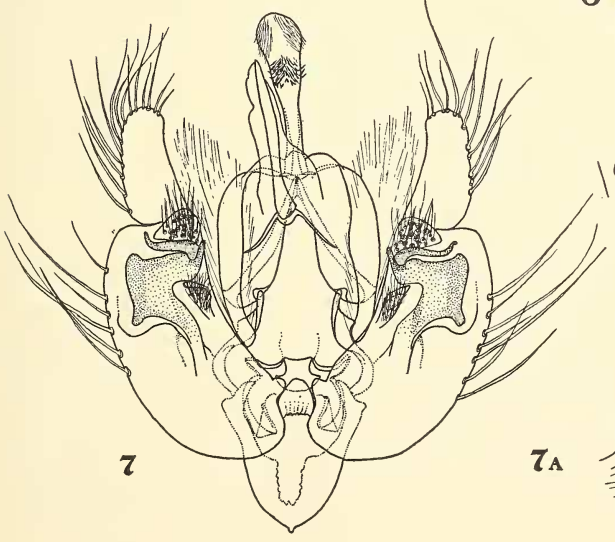

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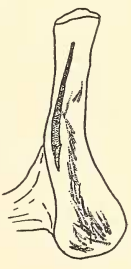


7A

The larva of this species is extremely similar to those of *sidus, vinulenta* and *morrisoni,* and there are apparently no satisfactory characters for the separation of the species. *E. tristigmata* differs from the four species mentioned in having the cervical shield uniform, without the transverse, lateral, pale line on each side.

Head dark brown with the occipital area pale yellow, some reticulation on the sides above the ocelli. Cervical shield dark brown with a wide, pale line on each side, this continuing back on the thoraic and abdominal segments as a very faint, narrow, pale subdorsal line on each side. The dorsum of all segments velvety, dark greenish brown, the sides somewhat lighter and with an indication of very vague reticulations; lateral line narrow on the thoracic segments, widening on the abdominal segments, white with a pinkish tint, most intense on last two or three abdominal segments; venter pale yellowish with a strong greenish cast, some pinkish hues below lateral line, most noticeable on thoracic segments. Foodplant: *Prunus serotina* Ehrh.

Type: Male, Arlington, Virginia, 19 October 1949, J. G. Franclemont, in U. S. National Museum Collection (*ex* Franclemont Collection); USNM Type No. 61479.

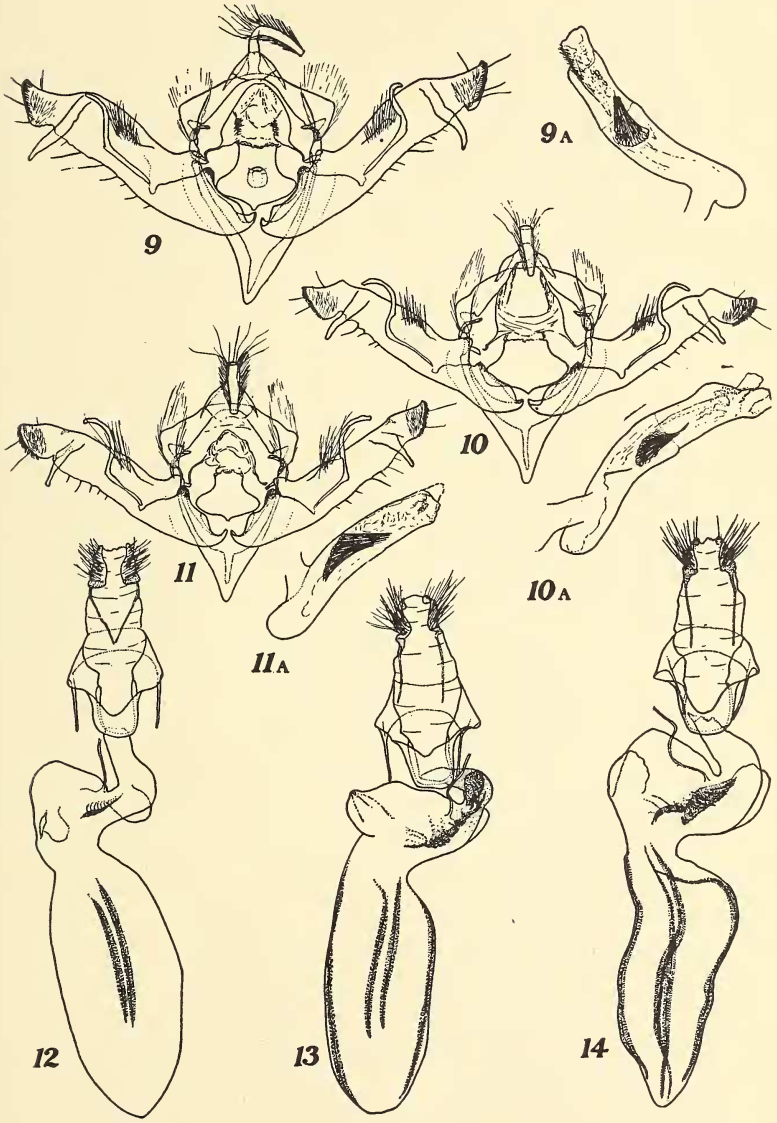
Paratypes: 54 males and 52 females, Arlington, Virginia, 14 October–24 November, 1948–1950; 103 in Franclemont Collection, 3 in Cornell University, Department of Etomology Collection. 12 males and 11 females, Arlington, reared, emergence dates, 31 July–13 September 1949; 22 in Franclemont Collection, 1 in Cornell Collection. 3 males and 10 females, Washington, D. C., reared (No. 3336), emergence dates 7–22 October 1884, A. Koebele; 1 female, Washington, D. C., 12 April 1884, A. Koebele; all in the U. S. National Museum Collection.

In addition this moth has been seen from the following localities: Pittsburgh, Pennsylvania; Quincy, Illinois; and Manitoba, one specimen collected by Health. Additional material is needed from the last locality to verify the reliability of the label on the single specimen. In collecting at "Springhill," Arlington, this has been

Explanation of Plate IX

9. *Eupsilia cirripalea,* male genitalia. 9A. *E. cirripalea,* male genitalia, aedoeagus. 10. *E. sidus,* male genitalia. 10A. *E. sidus,* male genitalia, aedoeagus. 11. *E. vinulenta,* male genitalia. 11A. *E. vinulenta,* male genitalia, aedoeagus. 12. *E. cirripalea,* female genitalia. 13. *E. vinulenta,* female genitalia. 14. *E. sidus,* female genitalia.

BULL. B. E. S. VOL. XLVII PLATE IX



the commonest of the four "red" species of *Eupsilia,* the others in order being *vinulenta, sidus* and *tristigmata.*

Eupsilia vinulenta (Grote)

Dichagramma vinulenta Grote, Proc. Ent. Soc. Philadelphia, vol. 2, p. 440, pl. 9, fig. 6, 1864.

Type locality: "Texas" (". . . collected by Mr. E. T. Cresson in Western Texas."). [I am inclined to view the citation of this locality with some misgivings and to believe that the moth might have been collected in the vicinity of Philadelphia.]

Location of type: Lost! When described, it was in the collection of the Entomological Society of Philadelphia.

The figure of the moth published with the original description is an excellent representation of the moth I connect with this name.

The vestiture of the forewings smooth, the scales moderately dentate; the fringe less strongly toothed than in *cirripalea.* The general color of the forewing cinnamon red with some lighter tints and conspicuous violet or blackish violet tints; the basal one-third of wing usually strongly tinted with violaceous and contrasting with the outer two-thirds of wing. The lines conspicuous; t. a. line wide, erect, pale, often not contrasting with the basal third of wing of which it forms the outer margin; median shade vague, angled out below reniform; t. p. line fine, black, dentate; s. t. line pale, dentate; reniform spot orange, white or rarely yellowish. This species occurs throughout the eastern half of Canada and the United States; the westernmost records are Iowa and Manitoba.

Male genitalia (figures 11 and 11A) similar to *sidus,* the juxta less massive, the spines on the vesica almost twice as long.

Female genitalia (figure 13) similar to *sidus,* with four longitudinal signa on the bursa, but with an area of heavy chitinization in the middle of the ductus bursae, and with the chitinized, ridged area at the junction of the ductus bursae and bursa not as extensive nor as heavy.

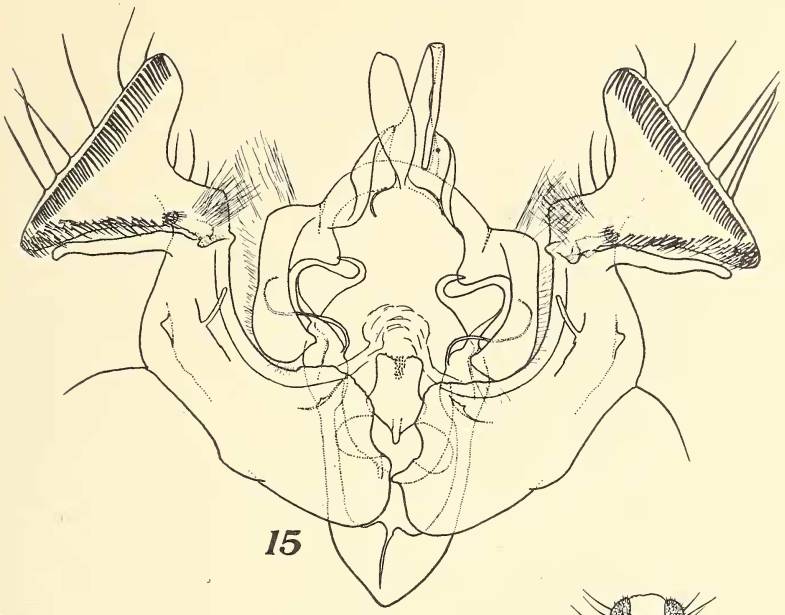
AMPHIPYRINAE

Apamea smythi n. sp.

Similar to *Apamea lignicolora* (Guenée), with which it has been

EXPLANATION OF PLATE X

15. *Apamea smythi,* male genitalia. 15A. *A. smythi,* male genitalia, aedoeagus with vesica fully extended. 16. *A. smythi,* female genitalia.



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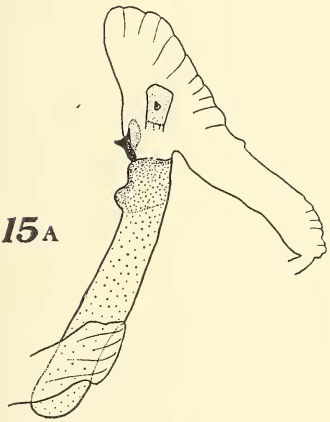
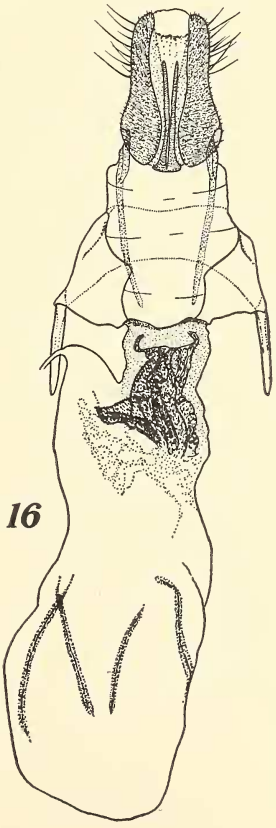


15A



16

confused, but larger, darker brown, and with the s. t. line lacking the two strong teeth on M_3 and Cu_1; the male genitalia similar, but larger and with a more expanded cucullus of the valve; the female genitalia with the ductus bursae shorter and stouter.

Head, thorax and forewings dark brown with a slight purplish cast; all the ordinary markings on the forewings well defined. Basal half-line dentate, black; t. a. line double, inner line darker ground color, the outer blackish, with pale filling between; t. p. line double, the inner blackish, the outer darker ground color, with pale filling between; the s. t. line undulating, with a pale spot at apex beyond it, with dark spots before it in the interspaces between M_1 and M_2, M_2 and M_3, and below Cu_2; the veins lined with the blackish between the t. p. and s. t. lines; fringe dark, interrupted by pale lines at the ends of the veins; orbicular flat, elliptical, its base resting on the t. a. line, well defined by a wide pale annulus surrounded by a narrow blackish brown one; reniform erect, of the usual shape, surrounded by a pale annulus and that by a narrow dark one, most evident on inner side, lower portion filled with dark gray; the claviform a broad loop, strongly outlined by blackish in two specimens and vaguely in the other two. Hind wing dark fuscous brown; the fringe paler. Beneath both wings fuscous with a common t. p. line; the forewing darker on the disk; the hind wing paler on the disk and with a prominent, dark discal spot.

Expanse: 52–53 mm. This is the largest species of *Apamea* (*Septis*) in the eastern states; its only rivals being the western species *maxima* and *acera*.

Male genitalia as figured. (Figures 15 and 15A.)

Female genitalia as figured. (Figure 16.)

Type: Male, Montgomery County, Virginia, E. A. Smyth, in U. S. National Museum Collection (*ex* Smyth Collection); USNM Type No. 61480. [The apex of the right forewing is damaged, otherwise the specimen is in excellent condition.]

Paratypes: 2 females, Montgomery County, Virginia, July 21, 1903, and July 19, 1907, E. A. Smyth, in U. S. National Museum Collection (*ex* Smyth Collection). 1 female, Blacksburg, Virginia, July 23, in Franclemont Collection (*ex* Erb Collection).

The exact locality in Montgomery County where these four specimens were collected is a moot question. I doubt the Blacksburg locality on the specimen in my collection; Blacksburg was Smyth's home. Poverty Hollow was apparently one of Smyth's favorite collecting localities; Hermann J. Erb visited him and col-

lected with him on occasion. There are probably other specimens of this moth in various collections because Smyth did a great amount of exchanging with other collectors. Erb disposed of some of his collection before his death, and it was from him that I purchased the specimen in 1935.

This species is named in honor of the late Professor E. A. Smyth, whose collection was generously given to the U. S. National Museum by his heirs.

Acknowledgement

I wish to express my sincere thanks to D. S. Fletcher, of the British Museum (Natural History), for furnishing me with conclusive evidence as to the identity of Walker's types of *illapsa* and *associans,* and Guenée's types of *lubricans;* without this help, it would have been impossible to be absolutely sure to which of the three species, occuring in eastern North America, the names applied.

BOOK NOTES

Fleas, Flukes & Cuckoos, by Miriam Rothschild and Theresa Clay. xiv + 304 pp., 99 black and white photographs, 4 maps and 22 drawings. 6 × 9 ins., cloth bound. 1952. The Philosophical Library, Inc., New York, N. Y. (Price, $8.75).

This interesting volume is devoted to a study of the parasites of birds, a subject which has not been treated in an independent way in the past although brief references to some of the fascinating aspects of avian parasitology are standard inclusions in biology texts.

Part One of the book considers such fundamental aspects as parasitism, commensalism, symbiosis, effects of parasitism both on the host and the parasite and the origins of parasitism. Part Two is devoted to fleas and feather lice while Part Three is a rapid survey of the main groups of bird parasites found in Britain.

The material is presented in a exceedingly fine fashion and is accompanied by excellent illustrations. The printing and the binding are of high quality.—George S. Tulloch, Merrick, N. Y.